Claims:

1.   A method of providing a client computer with
remote access to an application controlled by a server
across a data network without maintaining a dedicated
communications channel between the client and the
server, comprising the steps of:

a) providing a network addressable server-side
service which executes one or more predefined
procedures to control said application in response
to predefined application control commands received
by the server over the network;

b) providing a definition of said application
control commands, said definition being accessible
over the data network by a client to enable the
client to provide an interface which formulates
said predefined commands and addresses said
commands to the server-side service in response to
inputs to the client;

c) providing instructions accessible over the data
network by the client which define a network
addressable client-side service which executes one
or more predefined procedures to generate
notifications on the client in response to
predefined notification commands received by the
client over the network; and

d) providing on the server an interface between the
application and the data network which is effective
to issue one or more of said notification

generation commands in response to notifications of events received from the application;

whereby the server-side service provides a network addressable control service to enable the client to

5 control said application on the server, and the client-side service provides a network addressable notification service to enable the server to notify the client of events occurring in the application.

10 2.   A method as claimed in claim 1, wherein said server-side service and said client-side service are each provided as web services between a provider and a remote consumer, the consumer of the server-side service being the client interface and the consumer of

15 the client-side service being the server interface.

3.   A method as claimed in claim 2, wherein the definition of said application control commands is a web services description language (WSDL) file provided

20 on the server.

4.   A method as claimed in claim 3, wherein said WSDL file includes said instructions which define said client-side web service.

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5.   A method as claimed in claim 3, wherein said WSDL file includes instructions for the client to access said instructions which define said client-side web service over the network.

6.   A method as claimed in claim 1, wherein said
application is a computer telephone integration (CTI)
application in communication with a telephony network,
5   whereby the interface on the client enables a user of
the client to control a device on said telephony
network and the interface on the server enables the CTI
application to issue notifications of telephony network
events or state changes relating to the device to the
10   user of the client.

7.   A method as claimed in claim 1, wherein said
data network is a packet switching network employing
the transport communication protocol/internet protocol
15   (TCP/IP) method of addressing packets from the client
to the server and vice versa.

8.   A method as claimed in claim 7, wherein the
data network is selected from a local area network, a
20   wide area network, and the Internet.

9.   A method as claimed in claim 1, wherein said
server is a web server running said application.

25   10.   A method as claimed in claim 1, wherein said
server is a web server and said application runs on a
computer in communication with said server.

11.   A computer program product comprising machine
readable instructions which, when executed on a
computer which is connected to a data network and which
has control of an application, are effective to cause
5   the computer to:

a) provide a network addressable server-side
service which executes one or more predefined
procedures to control said application in response
to predefined application control commands received
10   by the computer over the network;

b) provide a definition of said application control
commands, said definition being accessible over the
data network by a remote client to enable the
remote client to provide an interface which
15   formulates said predefined commands and addresses
said commands to the server-side service in
response to inputs to the client;

c) provide instructions accessible over the data
network by the remote client which define a network
20   addressable client-side service which executes one
or more predefined procedures to generate
notifications on the client in response to
predefined notification commands received by the
client over the network; and

25   d) provide on the computer an interface between the
application and the data network which is effective
to issue one or more of said notification
generation commands in response to notifications of
events received from the application;

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whereby the server-side service provides a network addressable control service to enable the client to control said application on the computer, and the client-side service provides a network addressable

5 notification service to enable the server to notify the client of events occurring in the application, without maintaining a dedicated communications channel between the remote client and the computer.

10 12. A server having control over an application and comprising a network connection for enabling the server to connect to a data network, and a storage area for storing instructions which when executed are effective to:

15 a) provide a network addressable server-side service which executes one or more predefined procedures to control said application in response to predefined application control commands received by the computer over the network;

20 b) provide a definition of said application control commands, said definition being accessible over the data network by a remote client to enable the remote client to provide an interface which formulates said predefined commands and addresses

25 said commands to the server-side service in response to inputs to the client;

c) provide instructions accessible over the data network by the remote client which define a network addressable client-side service which executes one

30 or more predefined procedures to generate

notifications on the client in response to predefined notification commands received by the client over the network; and

d) provide on the computer an interface between the application and the data network which is effective to issue one or more of said notification generation commands in response to notifications of events received from the application;

whereby the server-side service provides a network addressable control service to enable the client to control said application on the computer, and the client-side service provides a network addressable notification service to enable the server to notify the client of events occurring in the application, without maintaining a dedicated communications channel between the remote client and the computer.

13.   A method of remotely controlling an application from a client computer across a data network, said application being under the local control of a server on the data network, without maintaining a dedicated communications channel between the client and the server, comprising the steps of:

a) receiving from the server a definition of application control commands which cause a network addressable server-side service to execute one or more predefined procedures to control said application;

b) providing on the client an interface based on said definition which formulates said predefined

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commands and addresses said commands to the server-side service in response to inputs to the client;

c) receiving instructions over the data network which define a network addressable client-side service which executes one or more predefined procedures to generate notifications on the client in response to predefined notification commands received by the client over the network; and

d) providing on the client said network addressable client-side service which monitors for receipt of said notification generation commands and which generates said notifications on the client in response thereto;

whereby the server-side service provides a network addressable control service to enable the client to control said application on the server, and the client-side service provides a network addressable notification service to enable the server to notify the client of events occurring in the application.

14. A method as claimed in claim 13, wherein said server-side service and said client-side service are each provided as web services between a provider and a remote consumer, the consumer of the server-side service being the client interface and the consumer of the client-side service being the server interface.

15. A method as claimed in claim 14, wherein the definition of said application control commands is a

web services description language (WSDL) file provided
on the server.

16.   A method as claimed in claim 15, wherein said
5   WSDL file includes said instructions which define said
client-side web service.

17.   A method as claimed in claim 15, wherein said
WSDL file includes instructions for the client to
10   access said instructions which define said client-side
web service over the network.

18.   A method as claimed in claim 13, wherein said
application is a computer telephone integration (CTI)
15   application in communication with a telephony network,
whereby the interface on the client enables a user of
the client to control a device on said telephony
network and the interface on the server enables the CTI
application to issue notifications of telephony network
20   events or state changes relating to the device to the
user of the client.

19.   A method as claimed in claim 13, wherein said
data network is a packet switching network employing
25   the transport communication protocol/internet protocol
(TCP/IP) method of addressing packets from the client
to the server and vice versa.

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20.   A method as claimed in claim 19, wherein the data network is selected from a local area network, a wide area network, and the Internet.

5   21.   A computer program product comprising machine readable instructions which, when executed on a computer which is connected to a data network, are effective to cause the computer to:

10   a) receive from a server across the network a definition of application control commands which cause a network addressable server-side service to execute one or more predefined procedures to control said application;

15   b) provide on the computer an interface based on said definition which formulates said predefined commands and addresses said commands to the server-side service in response to inputs to the computer;

20   c) receive instructions over the data network which define a network addressable client-side service which executes one or more predefined procedures to generate notifications on the computer in response to predefined notification commands received by the computer over the network; and

25   d) providing on the computer said network addressable client-side service which monitors for receipt of said notification generation commands and which generates said notifications on the computer in response thereto;

whereby the server-side service provides a network

30   addressable control service to enable the computer to

control said application on the server, and the client-side service provides a network addressable notification service to enable the server to notify the computer of events occurring in the application,

5 without maintaining a dedicated communications channel between the remote client and the computer.

22.   A client computer for providing remote control over an application across a data network, comprising a

10 network connection for enabling the client computer to connect to said data network, and a storage area for storing instructions which when executed are effective to cause the client to:

a) receive from a server across the network a

15 definition of application control commands which cause a network addressable server-side service to execute one or more predefined procedures to control said application;

b) provide on the computer an interface based on

20 said definition which formulates said predefined commands and addresses said commands to the server-side service in response to inputs to the computer;

c) receive instructions over the data network which define a network addressable client-side service

25 which executes one or more predefined procedures to generate notifications on the computer in response to predefined notification commands received by the computer over the network; and

d) providing on the computer said network

30 addressable client-side service which monitors for

receipt of said notification generation commands and which generates said notifications on the computer in response thereto;

whereby the server-side service provides a network
5 addressable control service to enable the computer to control said application on the server, and the client-side service provides a network addressable notification service to enable the server to notify the computer of events occurring in the application,
10 without maintaining a dedicated communications channel between the remote client and the computer.

23. A system comprising a client and a server connected across a data network, the client and the
15 server each being provided with a storage area for storing instructions to allow asynchronous interaction between the client and server, and the server having control of an application, wherein:

(I) the storage area of the server stores instructions
20 which when executed are effective to cause the server to:

a) provide a network addressable server-side service which executes one or more predefined procedures to control said application in response
25 to predefined application control commands received by the server over the network;

b) provide a definition of said application control commands, said definition being accessible over the data network by the client to enable the client to
30 provide an interface which formulates said predefined commands and addresses said commands to

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the server-side service in response to inputs to the client;

c) provide instructions accessible over the data network by the client which define a network addressable client-side service which executes one or more predefined procedures to generate notifications on the client in response to predefined notification commands received by the client over the network; and

d) provide on the server an interface between the application and the data network which is effective to issue one or more of said notification generation commands in response to notifications of events received from the application;

and

(II) the storage area of the client stores instructions which when executed are effective to cause the client to:

a) receive from the server across the network said definition of application control commands;

b) provide on the client an interface based on said definition which formulates said predefined commands and addresses said commands to the server-side service in response to inputs to the client;

c) receive over the data network said instructions which define a network addressable client-side service; and

d) provide on the client said network addressable client-side service which monitors for receipt of

said notification generation commands and which generates said notifications on the computer in response thereto;

whereby the server-side service provides a network addressable control service to enable the client to control said application on the computer, and the client-side service provides a network addressable notification service to enable the server to notify the client of events occurring in the application, without maintaining a dedicated communications channel between the remote client and the computer.

24.   A method of providing an asynchronous interaction between a client and a server, comprising the steps of providing Web Services on the server to be consumed by the client and providing Web Services on the client to be consumed by the server, whereby each of the client and server acts as both a Web Services provider and a Web Services consumer, such that when acting as a consumer each can notify the other of events asynchronously by invoking a Web Services command, and wherein said asynchronous interaction is provided without maintaining a dedicated communications channel.